

CLAIMS

What is claimed is:

- 5 1. A composition comprising a hydrocarbon polymer having a backbone comprising repeat units, at least 80 mol-% of which repeat units comprise one or more oxygen or nitrogen atoms disposed in said backbone; about 1%-30% by volume of a mineral filler having an aspect ratio of 5 or less, the filler having an average equivalent spherical diameter in the range of about 0.1 to less than about 3.5 micrometers, and a saturated organic acid, salt thereof, or a mixture thereof, at a concentration of at least about 0.5% by weight of the mineral filler.
- 10 2. The composition according to Claim 1 wherein the composition comprises about 5-30% by volume of a mineral filler.
3. The composition according to Claim 1 wherein the composition comprises about 10-20% by volume of a mineral filler.
- 15 4. The composition of according to Claim 1 wherein the average equivalent spherical diameter is about 0.5 to about 2 micrometers.
5. The composition according to Claim 1 wherein the concentration of saturated organic acid, salt thereof, or mixture thereof is in the range of about 0.5-4% by weight.
- 20 6. The composition according to Claim 1 wherein the saturated organic acid, salt thereof, or mixture thereof comprises one or more saturated fatty acids, salts thereof, or a mixture thereof.
7. The composition according to Claim 6 wherein the saturated fatty acid is stearic acid.
- 25 8. The composition according to Claim 4 wherein the saturated organic acid is stearic acid at a concentration of about 2% by weight on the weight of the filler.
9. The composition according to Claim 1 wherein the inorganic filler is calcium carbonate or titanium dioxide.
10. The composition of Claim 1 wherein the hydrocarbon polymer is selected from the group consisting of polyacetal, polyamide, and polyester.
11. The composition of Claim 10 wherein the hydrocarbon polymer is polyoxymethylene homopolymer.
12. The composition of Claim 10 wherein the hydrocarbon polymer is a copolymer comprising repeat units of oxymethylene and up to 10 mol-% of oxyalkylene repeat units having adjacent methylene groups.
- 35 13. The composition of Claim 10 wherein the hydrocarbon polymer is nylon 66 or nylon 6.

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14. The composition of Claim 10 wherein the hydrocarbon polymer is polyethylene terephthalate or polybutylene terephthalate.

15. A shaped article comprising the composition of Claim 1.

16. A process for forming a composition, comprising the steps of
5 combining a hydrocarbon polymer having a backbone comprising repeat units, at least 80 mol-% of which repeat units comprise one or more oxygen or nitrogen atoms disposed in said backbone, with a mineral filler having an aspect ratio of less than 5, the mineral filler having an average equivalent spherical diameter in the range of about 0.1 to about 3.5 micrometers, and a saturated organic acid, salt
10 thereof, or a mixture thereof, at a concentration of at least about 0.5% by weight of the mineral filler, the mineral filler and the hydrocarbon polymer being combined at a weight ratio given by the formula:

$$Wf/Wp = [VF/(1-VF)] \cdot Df/Dp$$

15 where Wf is the weight of the filler, Wp is the weight of the polymer, VF is the desired volume fraction of filler, in the range of about 0.01-0.3, Df is the density of the filler, and Dp is the density of the polymer;

20 heating the combination to a temperature above the melting point of the hydrocarbon polymer to form a molten composition;

mixing the molten composition to provide a homogenous melt; and, cooling the molten composition.

17. The process of Claim 16 wherein VF is in the range of about 0.1-0.3.

18. The process of Claim 16 wherein VF is in the range of 0.1-0.2.

25 19. The process of Claim 16 wherein the average equivalent spherical diameter is about 0.5-2 micrometers.

20. The process of Claim 19 wherein the saturated organic acid, salt thereof, or mixture thereof comprises saturated fatty acids, salts thereof, or a mixture thereof.

30 21. The process of Claim 20 wherein the saturated organic acid is stearic acid at a concentration of about 2% by weight on the weight of the filler.

22. The process of Claim 20 wherein the saturated fatty acid is stearic acid.

35 23. The process of Claim 16 wherein the inorganic filler is calcium carbonate or titanium dioxide.

24. The process of Claim 16 wherein the comonomer units are ethylene oxide units.

25. The process of Claim 13 wherein the hydrocarbon polymer is selected from the group consisting of polyacetal, polyamide, and polyester.

26. The process of Claim 16 wherein the hydrocarbon polymer is polyoxymethylene homopolymer.

27. The process of Claim 16 wherein the hydrocarbon polymer is a copolymer comprising repeat units of oxymethylene and up to 10 mol-% of oxyalkylene repeat units having adjacent methylene groups.

28. The process of Claim 16 wherein the hydrocarbon polymer is nylon 66 or nylon 6.

29. The process of Claim 16 wherein the hydrocarbon polymer is polyethylene terephthalate or polybutylene terephthalate.

30. The process of Claim 16 further comprising the step of forming a shaped article.

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